ABSTRACT OF THE DISCLOSURE

The present invention provides RecA mutant proteins, having either a single mutation or a double mutation. The RecA mutant proteins are highly proficient in both SSB displacement and steady state binding of DNA in the presence or absence of SSB as compared to the wild-type protein. The single RecA mutant, RecAΔC17, has 17 amino acid residues removed from the carboxyl terminus. The double mutant RecA, RecAΔC17/E38K, combines the 17 amino acid residue C-terminal deletion of RecAΔC17, with a single amino acid change from Glutamate to Lysine at position 38. These RecA mutant proteins are pH sensitive allowing control over formation of products. Hence, methods of using the novel RecA mutants and kits having the RecA mutants as components thereof are also contemplated by the present invention.

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